REMARKS/ARGUMENTS

The Action dated August 1, 2005, has been reviewed and the comments carefully considered.

Claims 18, 20 and 21 are pending in the application. Claims 18, 20 and 21 are rejected under 35 USC §112 and 35 USC §103, as discussed below.

Claim Rejections Under 35 USC §112

Claim 18, and claims 20 and 21 depending therefrom, are rejected under 35 USC §112 as failing to comply with the written description requirement. Applicant respectfully disagrees.

According to the Action, there is no support for the limitation "wherein the ketone is not a 2-ketoacid and the amine is not an alpha-amino acid." Applicant notes that the distinction between a 2-ketoacid and a ketone and between an alpha-amino acid and an amine is made several places in the specification. See, e.g., page 4, lines 18, 19, 21, 33-34; page 5, lines 1-4, 33-34; page 9, lines 19, 20, 30-31, 34; page 10, line 11. In particular, see page 2, line 7, which specifically discusses the rarity of "the enzyme catalyzed reductive amination of ketones that are not 2-ketoacids" and page 11, lines 1-2, describing how "a ketone that is not a ketoacid" is converted to an amine.

Claims 18, 20 and 21 are also rejected under 35 USC §112, second paragraph, as indefinite as the fashion or result of the mutation in the mutated enzyme is not "seen in comparison with a not mutated enzyme." Specifically, the Action posits that one would not know whether an enzyme is encompassed by the claims. Applicant respectfully disagrees.

As clearly set forth in the claim, the mutant enzyme "catalyzes reductive amination of the target ketone," something naturally occurring enzymes do not do. Methods of creating mutant enzymes are well known and the method used to produce the mutant enzyme are not limited by the claims. Starting with an enzyme that does not catalyze reductive amination of a ketone, and mutating it by any of a number of well known techniques to produce one that does catalyze reductive amination of a ketone

would produce a "mutated enzyme" within the scope of the claims, as would be appreciated by the skilled artisan.

Claim Rejection Under 35 USC §103

In order to establish a prima facie case of obviousness, three requirements must be satisfied. First, there must be some suggestion or motivation in the prior art relied upon to modify the reference. See *In re Fine*, 837 F2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Second, there must have been a reasonable expectation of success for the proposed modification, at the time the invention was made. See *Amgen, Inc. v. Chugai Pharm. Co.*, 927 F2d 1200, 1209, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991). Third, the prior art reference must teach or suggest all the limitations of the claims. See *In re Wilson*, 424 F2d 1382, 1385, 165 USPQ 494, 496 (C.C.P.A. 1970).

Applicant respectfully submits that the Office Action fails to make a prima facie case of obviousness, as the prior art references do not teach or suggest all the limitations of claim 18, the sole independent claim.

Claim 18, as amended, provides (emphasis added):

> A method for producing an amine from a target ketone, comprising:
>
> creating a mutated enzyme that catalyzes reductive amination of the target ketone; and
>
> providing the mutated enzyme in a reaction mixture comprising the target ketone under conditions sufficient to permit the formation of the corresponding amine to thereby produce the amine, wherein the ketone is not a 2-ketoacid and the amine is not an alpha-amino acid.

Applicant respectfully submits that the Office action points to no teaching or suggestion in any of the cited references for a method for producing an amine by reductively aminating a ketone using a mutated enzyme wherein the ketone is not a 2-ketoacid and the amine is not an alpha-amino acid.

According to the Action, Liu teaches in col. 2, lines 34-35, amino acid transaminases where keto compounds are converted to amines. Applicant respectfully disagrees. Liu cites only alpha-ketoacids being converted to amino acids and vice-

versa, never describing the reductive amination of a ketone to an amine. All of the examples in Liu describe amino acids being interconverted with 2-ketoacid.

Likewise, Engel, and the Table in columns 6-7, describe the improved reductive amination of a ketoacid to make an alpha-amino acid. The reductive amination of a ketone to an amine is not cited, described, or suggested. Yan, also cited in the Action, teaches only methods of making mutants. There is no teaching of making mutants that catalyze the reductive amination of a ketone that is not a 2-ketoacid to an amine that is not an alpha-amino acid.

Claims 20 and 21 depend, directly or indirectly from claim 18, and are submitted to be allowable as dependent upon an allowable base claim, and for the additional limitations recited therein.

Applicant respectfully submits that the instant Application is the first disclosure of a method for using mutated enzymes to produce amines that are not alpha-amino acids from ketones that are not 2-ketoacids by reductive amination.

In view of the foregoing amendment and response, it is believed that the application is in condition for allowance and, accordingly, reconsideration and allowance is earnestly solicited.

If any questions remain regarding the allowability of the application, Applicant would appreciate if the Examiner would advise the undersigned by telephone. If it would be helpful, Applicant would appreciate the opportunity to arrange an interview with the Examiner to discuss the claims of this application.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By Cynthia A. Bonner
Cynthia A. Bonner
Reg. No. 44,548
626/795-9900

CAB/tt
TXT IRV1090807.1-*-12/1/05 3:01 PM